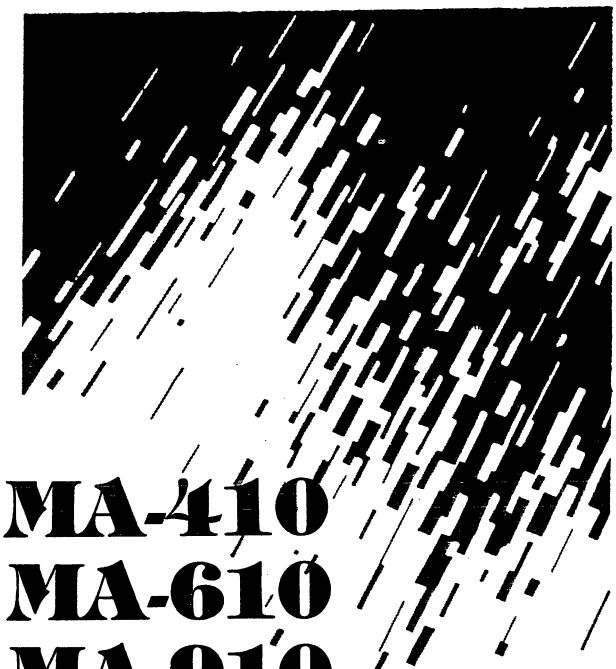
# OPERATING INSTRUCTIONS



## MODEL MA-410
## MA-610
## MA-910

*PROFESSIONAL*
***MUSIC AMPLIFIER***

INKEL®

## Unpacking and Installation

Although it is neither complicated to install nor difficult to operate your stereo amplifier, a few minutes of your time is required to read this manual for a properly wired installation and becoming familiar with its many features and how to use them.
Please take a great care in unpacking your amplifier and do not discard the carton and other packing materials. They may be needed when moving your set and are required if it ever becomes necessary to return your set for service. Never place the unit near radiators, in front of heating vents, in excessively humid or dusty location to avoid early damage and for your years of quality use. Connect your complementary components as illustrated in the following page.

## Features

- HIGH RELIABILITY
  To assure absolute long-term reliability, the output section of each channel incorporates Multiple Emitter Power Transistor, which provide safety margin 4:1.

- HIGH POWER DRIVE
  Triple diffused high power driver transistors are employed along with high speed, high voltage devices for pre-driver and inverter stages.

- ENERGY LIMITERS
  Voltage-current type energy limiters are incorporated for overload protection of the amplifier.
  Due to the large safe operating area of the output stage, the limiter does not actuate until driving 1.4 ohm load at full power.

- THERMAL OVERLOAD PROTECTION
  In MA-410 and MA-610, to protect the output stage from thermal overload, the output will be automatically diconnected from the load (Loud speaker) by use of thermal switch when the heatsink reaches to 95°C.
  The load will automatically be reconnected when the temperature drops to below 95°C.

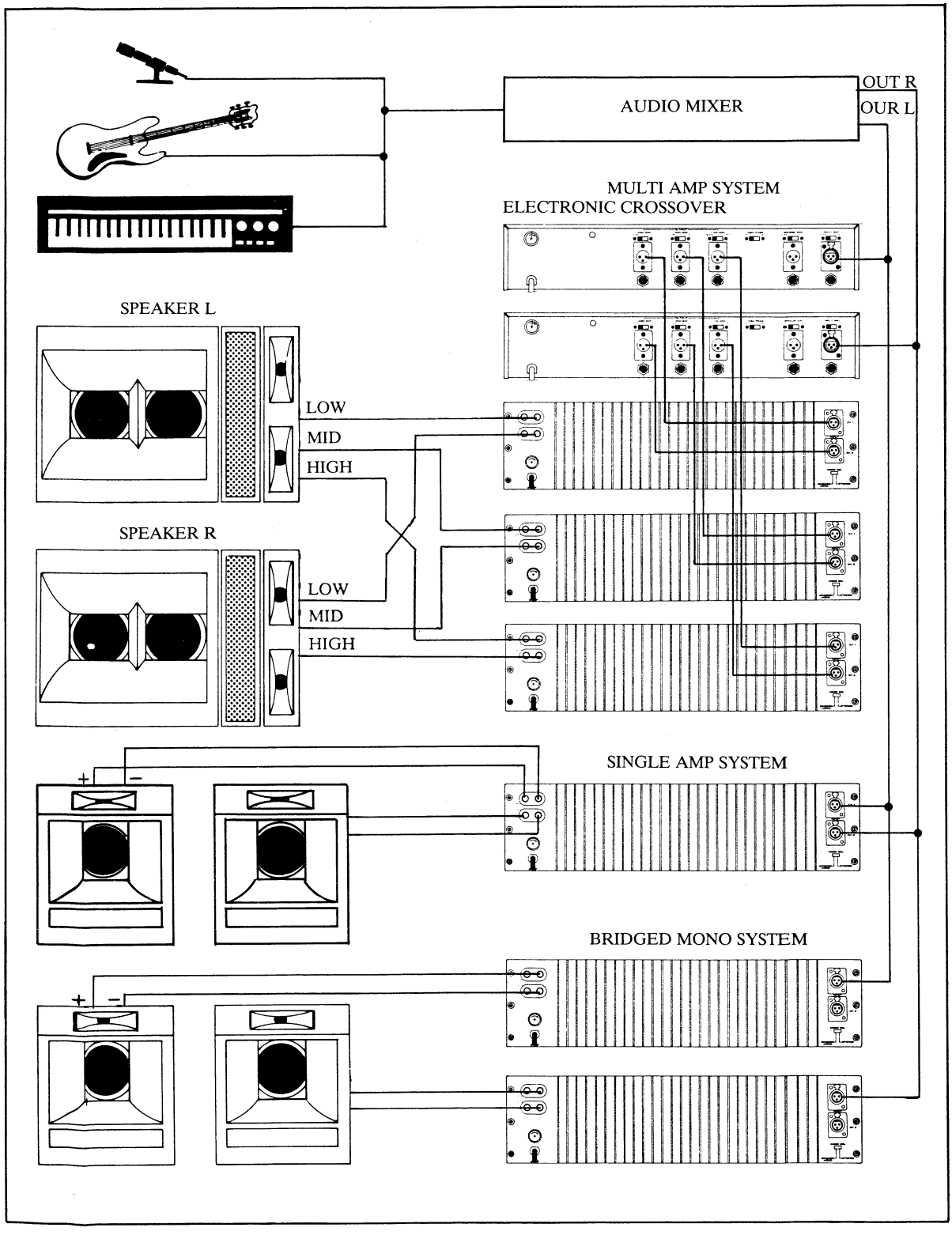
  In MA-910, when the temperature of main heatsink reaches to 70°C, fan is activated. And the fan is stopped when the temperature drops below 70°C.

- AC POWER PROTECTION
  When a harmful DC voltage is detected at the output terminals, the protection relay cuts off the primary AC line.

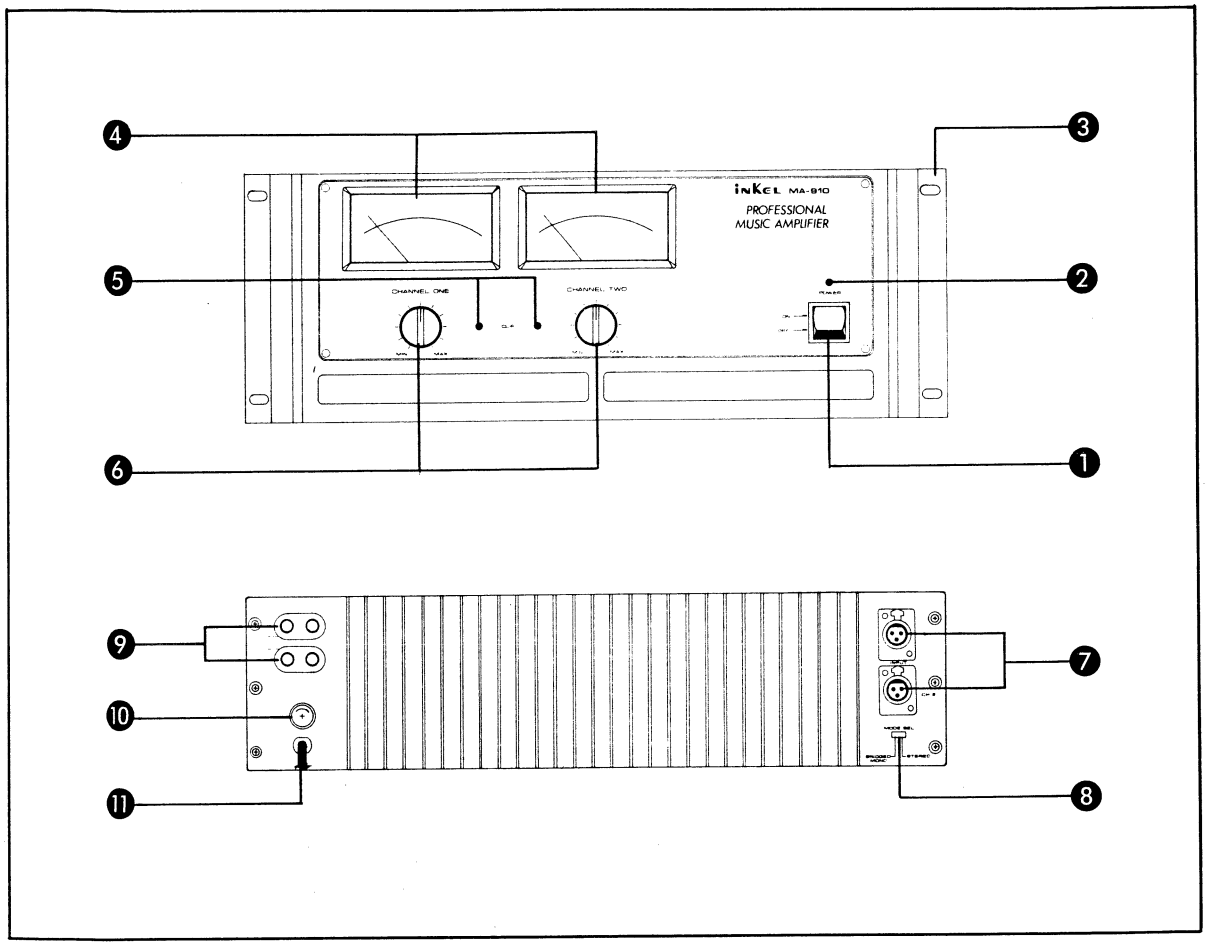
- SURGE CURRENT PROTECTION
  These amplifiers are provided with output fuses to protect the loudspeakers from surge current.

- BRIDGED MONO FUNCTION
  For more powerful sound, these amplifiers can be used for monoral sound by selecting the mode selector to bridged mono function.
  Please refer to BRIDGED MONO operation.

## Rear Panel Connections



## *Front Panel and Rear Panel Controls*




1. POWER SWITCH
   To turn the Amplifier ON or OFF, press the upper or lower of this switch button.

2. POWER INDICATING LED
   This LED indicates power is turned ON.

3. HANDLES
   You can handle this amplifier easily by using these handles.

4. VU meter
   The large VU meters are provided to monitor the output power of each channel.

5. CLIP INDICATORS
   Two LED indicators illuminate when the input signal levels exceed 3dB above clipping. Then you had better properly adjust the level controls.

6. LEVEL CONTROLS
   Separate level controls are provided for channel one and channel two input. Clockwise rotation of the controls increases level.

7. INPUT CONNECTORS
These XLR jacks are for unbalanced input signal.
A nominal RMS voltage of 1.5 volts will drive the amplifier to rated output, and the input impedance are nominally 15000 ohms.

8. MODE SELECTOR
Bridged mono operation is easily achieved by this recessed slide switch. The input is applied to channel one only, and the corresponding front panel gain control is used to set the level. Please note Bridged Mono Operation.

9. OUTPUT TERMINALS
Output terminals are dual five-way binding posts, which are identified as to polarity with a red and a black terminals. We suggest the use of dual banana plugs as a convenient and reliable method of hook-up.
Do not parallel the two outputs of each channel by connecting them (together, or parallel them) with any other amplifier output.

10. FUSE HOLDER
This fuse holder contains AC primary fuse. When fuse is blown out, it should be replaced with the same type just like following table.
If it continues to blow, stop replacing fuse and refer servicing to qualified personnel.

| Condition / Model | AC 100V/120V | AC 220/240V | Output |
|---|---|---|---|
| MA 410 | T8A | T4A | NB 6A |
| MA 610 | T10A | T6A | NB 8A |
| MA 910 | T15A | T8A | NB 12A |

* Output fuses are built in the sets.

11. AC POWER CORD
Plug this AC input cord into AC outlet.

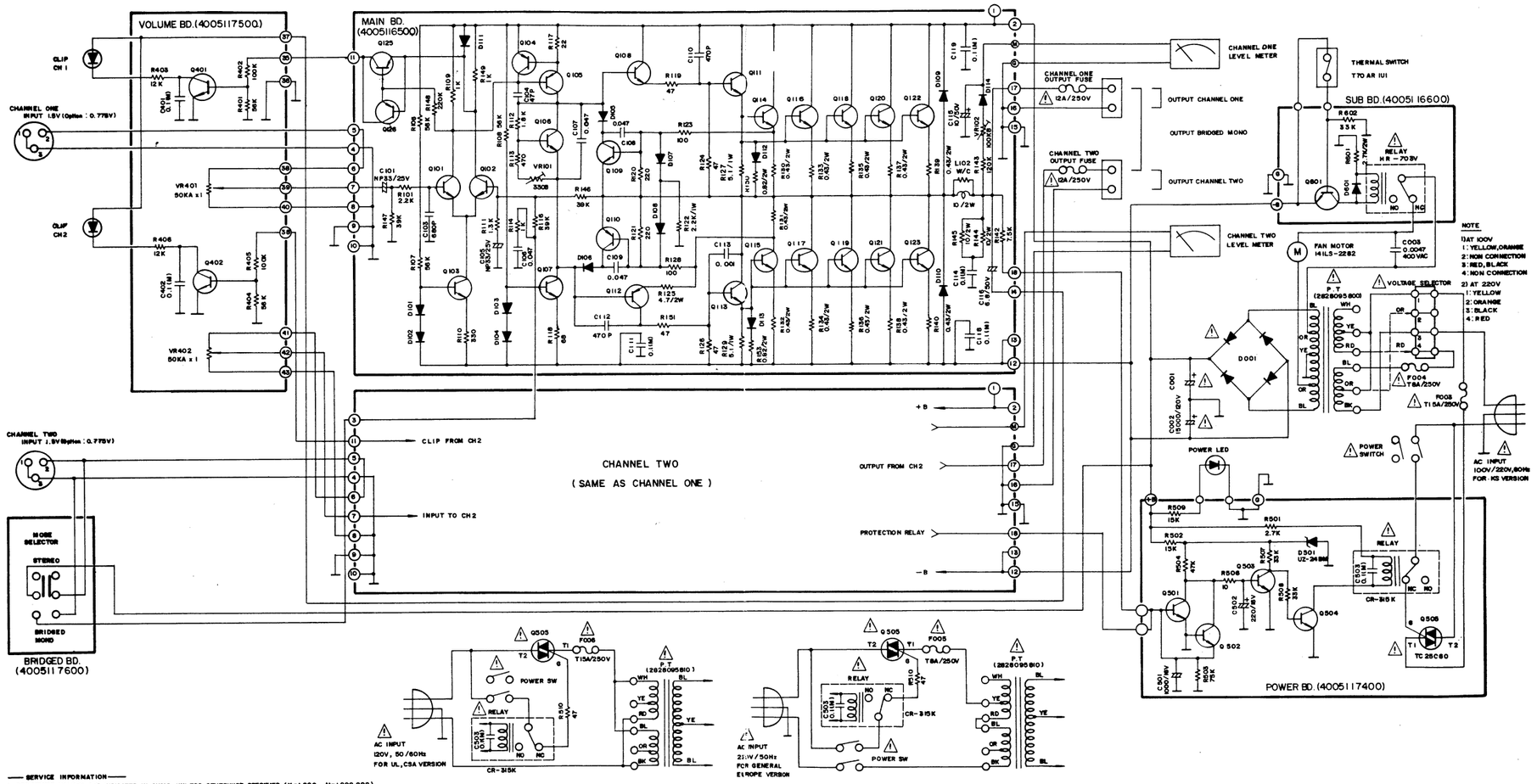
## *Bridged Mono Operation*

1. Set Mode Selector to MONO.
2. Connect a mono input signal to channel one input jack.
3. Connect the speaker load to the two red terminals of each channels. Please confirm the (+) terminal of speaker to channel one and the (–) terminal to channel two.
4. Do not use the black terminals of each channel.
5. Please notice to connect the speaker impedance 8 ohm or above.
6. And adjust the channel one volume not to illuminate the clip LEDs of front panel.

## Specifications

| MODEL | MA-410 | MA-610 | MA-910 |
|---|---|---|---|
| Rated Output Power | | | |
| at 8 ohms, 1KHz (Bridged Mono) | 260W | 560W | 700W |
| at 8 ohms, 1KHz (Stereo per CH) | 100W | 175W | 300W |
| at 4 ohms, 1KHz | 150W | 280W | 400W |
| Total Harmonic Distortion | 0.025% | | |
| Frequency Response (–0.5dB) | 20~20000 Hz | | |
| Signal to Noise Ratio | 110 dB | | |
| Input Sensitivity | 1.5V | | |
| Input Impedance | 15 Kohms | | |
| Channel Separation at 1 KHz | 80 dB | | |
| Power Consumption | 410W | 560W | 1050W |
| Dimensions | 483(W)x133(H)x385(D)mm | | 483(W)x177(H) x385(D)mm |
| Weight (Net) | 18 Kg | 19 Kg | 27 Kg |
| Power Requirement | AC100V/120V/220V/240V, 50Hz/60Hz | | |

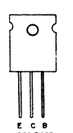
# MODEL MA-910

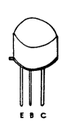


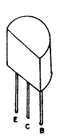

—— SERVICE INFORMATION ——

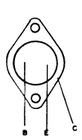
1. RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED. (K=1,000, M=1,000,000)
2. CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED. (M MICRO- MICROFARADS)
3. ALL VOLTAGES ARE REFERED TO GROUND UNDER THE FOLLOWING CONDITIONS. AC : R M S
4. —— PRECAUTION ——
   A) ALL COMPONENTS MARKED ⚠ MUST BE REPLACED ONLY WITH ORIGINAL TYPE SPECIFIED BY THE MANUFACTURER, DONG WON PA SOUND AND INSTALLED AS THE ORIGINAL WITH SPACERS AND POSITIONED AWAY FROM ADJACET COMPONENTS WHERE APPLICABLE.
   B) ALL SOLDERING MUST BE DONE IN A PROFESSIONAL MANNER USING SOLDER WITH RESIN CORE ONLY.
   C) ALL COVES, SHIELD AND INSULATING SPACERS MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER.
   D) A DAMAGED POWER SUPPLY CORD MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER.
   E) A DIELECTRIC TEST CONSISTING OF 1500VAC 60HZ IS TO BE APPLIED BETWEEN BOTH BLADES OF THE POWER SUPPLY CORD ATTACHMENT PLUG AND THE EXPOSE CONDUCTIVE SURFACE OF THE APPLIANCE FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING TO APPLIANCE TO CUSTOMER.
   F) THE -WW- MARKED RESISTORS ARE MOUNTING ABOVE THE P.C.B ON SLEEVES.

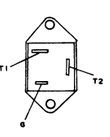
Q505 : TRIAC TC25C60
Q101 - Q103, Q401, Q402, Q501 - Q504, Q601 : KTC2240BL
Q104, Q110 : KTC1018Y
Q105, Q112 : 2N5415
Q107, Q108 : 2N3440
Q109 : KTC1815Y
Q111, Q113 - Q123 : 2SD424
Q125, Q126 : KTA970BL
Q106 : 2SC3423
D101 - D108, D111, D114 : CDG24
D109, D110, D113 : IN4004
D601, D001 : PB252



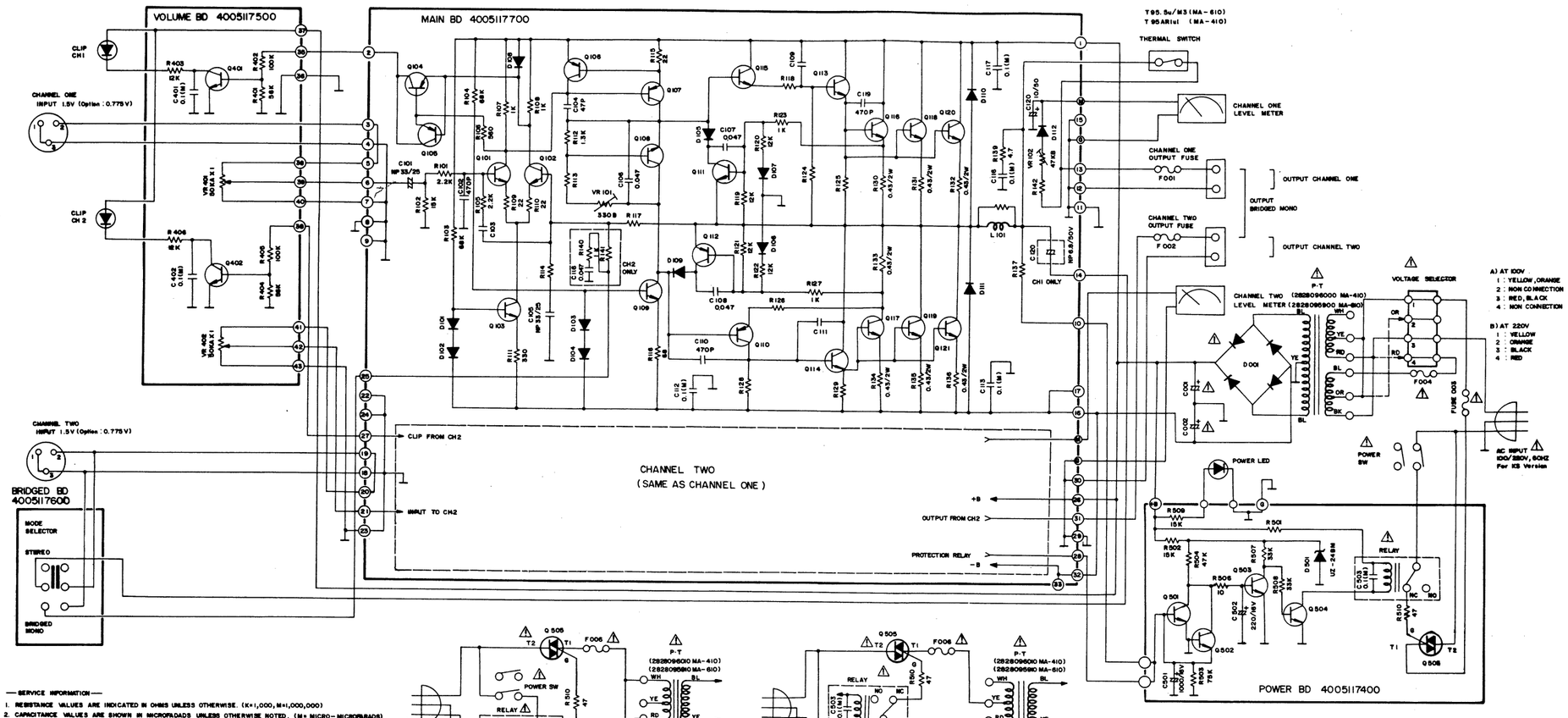



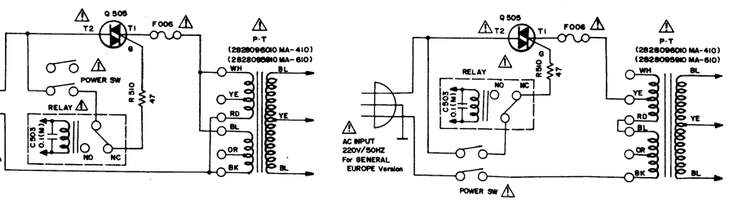



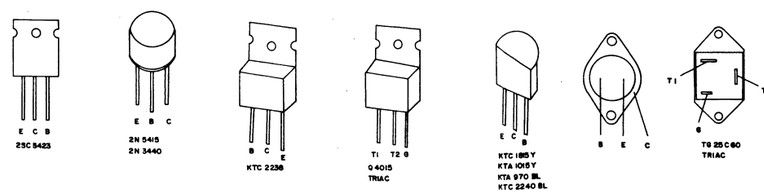



# MODEL MA-410
# MA-610








—SERVICE INFORMATION—

1. RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE. (K=1,000, M=1,000,000)
2. CAPACITANCE VALUES ARE SHOWN IN MICROFADADS UNLESS OTHERWISE NOTED. (M= MICRO-MICROFARADS)
3. ALL VOLTAGE ARE REFERED TO GROUND UNDER THE FOLLOWING CONDITIONS.
   AC : RMS
4. —PRECAUTION—
   A) ALL COMPONENTS MARKED ⚠ MUST BE REPLACED ONLY WITH ORIGINAL TYPE SPECIFIED BY THE MANUFACTURER, DOING WON PA SOUND AND INSTALLED AS THE ORIGINAL WITH SPACERS AND POSITIONED AWAY FROM ADJACENT COMPONENTS WHERE APPLICABLE.
   B) ALL SOLDERING MUST BE DONE IN A PROFESSIONAL MANNER USING SOLDER WITH RESIN CORE ONLY.
   C) ALL COVERS, SHIELD AND INSULATING SPACERS MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER
   D) A DAMAGED POWER SUPPLY CORD MUST BE REPLACED APPLIANCE TO CUSTOMER.
   E) A DIELECTRIC TEST CONSISTING OF 1500V AC 60Hz IS TO BE APPLIED BETWEEN BOTH BLADES OF THE POWER SUPPLY CORD ATTACHMENT PLUG AND THE EXPOSE CONDUCTIVE SURFACE OF THE APPLIANCE FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING TO APPLIANCE TO CUSTOMER.
   F) THE -⧫WW⧫- MARKED RESISTORS ARE MOUNTING ABOVE THE P.C.B ON SLEEVES.

—NOTE—

| | | | |
|---|---|---|---|
| Q101 - Q103, Q401 - Q402, Q501 - Q504 | KTC 2240 BL | | |
| Q104, Q105 | : KTA 970 BL | Q108 | : 2SC3423 |
| Q106, Q112 | : KTA 1015Y | Q116 - Q121 | : 2SD424 |
| Q111 | : KTC1815Y | D101 - D108, D112 | : CDG 26 |
| Q107, Q110 | : 2N5415 | D110, D111 | : 1N4004 |
| Q109, Q115 | : 2N3440 | D001 | : PB 252 |
| Q113, Q114 | : KTC2236Y | | |

NOTES

| MODEL NO | C103 | C109 | C111 | C001 C002 | F001 F002 | F003 F006 | F004 F005 | R501 | R113 | R24 | Q505 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MA-410 | 0.047 | 220P | 330P | 10000uF /80V | 6A/ 250V | 8A/ 250V | 4A/ 250V | 1.5K | 1K | 560 | TRIAC Q 4025 |
| MA-610 | 47 P | 470P ± 0.001 | | 10000uF /100V | 8A/ 250V | 15A/ 250V | 8A/ 250V | 1.8K | 820 | 680 | TRIAC T8 25C60 |

| MODEL NO | R117 | R118 | R124 | R125 | R126 | R128 | R129 | R137 | R141 | R142 |
|---|---|---|---|---|---|---|---|---|---|---|
| MA-410 | 10K | 120 | 220 | 3.3K | 120 | 220 | 3.3K | 4.7K | 10K | 100K |
| MA-610 | 15K | 39 | 100 | 39 | 39 | 100 | 39 | 7.5K | 15K | 75K |

OPTION

Q120, Q121, R132, R136 : MA-610 ONLY